Air Quality Permit

Issued To:	WBI - Cabin Creek Compressor Station Williston Basin Interstate Pipeline Company 1651 Cabin Creek Road #1 Baker, MT 59313	Permit #2484-03 Application Complete: 03/21/03 Preliminary Determination Issued: 04/28/03 Department Decision Issued: 05/16/03 Final Permit: 06/03/03 AFS #025-0003

An air quality permit, with conditions, is hereby granted to Williston Basin Interstate Pipeline Company – Cabin Creek Compressor Station (WBI – Cabin Creek), pursuant to Sections 75-2-204 and 211 of the Montana Code annotated (MCA), as amended, and Administrative Rules of Montana (ARM) 17.8.740, *et seq*., as amended, for the following:

I. Permitted Facilities

A. Plant Location

WBI – Cabin Creek operates a natural gas compressor station and associated equipment located in the SE¼ of the SE¼ of Section 16, Township 10 North, Range 58 East, Fallon County, Montana. The mailing address of the facility is 1651 Cabin Creek Road #1, Baker, MT 59313. A complete list of permitted equipment is contained in Section I.A of the permit analysis.

B. Current Permit Action

On March 21, 2003, the Department of Environmental Quality (Department) received a complete permit application from WBI – Cabin Creek for the installation and operation of an 1149 horsepower (hp) capacity natural gas fired turbine. WBI – Cabin Creek is a major stationary source of emissions as defined under the New Source Review Prevention of Significant Deterioration (PSD) program; however, potential emissions from the proposed turbine do not exceed any PSD significant emission thresholds and the current permit action does not trigger PSD review.

Further, WBI – Cabin Creek submitted a modeling analysis including annual NO_x ambient air impacts as well as 1- and 8-hour CO ambient impacts from the proposed turbine. A summary of modeled impacts is contained in Section VI of the permit analysis for the current permit action. Based on the ambient air modeling results initially submitted by WBI – Cabin Creek, and in accordance with the Department's "Monitoring Requirements" guidance document (October 9, 1998), the WBI – Cabin Creek facility, as initially proposed, would be required to conduct ambient monitoring because the modeled NO_2 concentration was above 95% of the ambient standard.

Subsequently, WBI – Cabin Creek submitted a letter to the Department requesting various permit changes to keep the source emission impacts below the applicable ambient standards for NO_x and to avoid the requirement for ambient NO_x monitoring. Specifically, under the current permit action, WBI – Cabin Creek is required to install a non-selective catalytic reduction system (NSCR) on Unit 1, raise the stack heights on Unit 1 and Units 4 through 10, lower the allowable NO_x emission rates for Units 8 through 10, and limit the operating hours for Unit 4 to 3500 hours during any rolling 12-month time period. Permit #2484-03 includes conditional requirements for all previously cited equipment/operational modifications.

Furthermore, WBI – Cabin Creek requested that the Department modify the testing schedule for the 559 hp Waukesha 3521GL (GEN1). Currently, based on Department source testing guidance, WBI – Cabin Creek is required to test GEN1 on an every-4-year schedule. However, the Title V operating permit for WBI – Cabin Creek requires semiannual testing for this unit. Therefore, at the request of WBI – Cabin Creek, the testing requirements for GEN1 have been modified to incorporate language allowing for consistency between the Montana Air Quality Permit and the Title V operating permit source testing schedules for this unit.

Finally, the Department updated all rule references to reflect the recent rule revisions.

II. Limitations and Conditions

A. Emission Limitations:

1. Emissions from the 559 Hp Waukesha 3521GL engine (Unit 17) shall not exceed the following (ARM 17.8.752):

NO_x[1]	2.46 lb/hr
CO	4.06 lb/hr
VOC	1.23 lb/hr

2. Emissions from the 1149 Hp Solar Saturn Mark II gas fired turbine (Unit 15) shall not exceed the following (ARM 17.8.752):

NO_x	2 grams per horsepower-hour (g/hp-hr) or 5.07 lb/hr
CO	3 g/hp-hr or 7.60 lb/hr
VOC	1 g/hp-hr or 2.53 lb/hr

3. Emissions from Unit 8 shall not exceed the following (ARM 17.8.749):

NO_x	17.46 lb/hr

4. Emissions from Unit 9 and Unit 10, individually, shall not exceed the following (ARM 17.8.749):

NO_x	23.28 lb/hr

5. Emissions from the 1109 Hp Waukesha engine (Unit 1) shall not exceed the following (ARM 17.8.749):

NO_x	2.00 g/hp-hr or 4.88 lb/hr
CO	10.00 g-hp-hr or 24.40 lb/hr
VOC	0.075 g/hp-hr or 0.18 lb/hr

6. WBI - Cabin Creek shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources or stacks installed on or before November 23, 1968, that exhibit an opacity[2] of 40% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

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[1] NOx reported as NO_2.

[2] Opacity shall be determined according to 40 CFR Part 60, Appendix A, Method 9 Visual Determination of Opacity of Emissions from Stationary Sources.

7. WBI - Cabin Creek shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any sources or stacks installed after November 23, 1968, that exhibit an opacity[2] of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

B. Operational Limitations

1. WBI – Cabin Creek shall not burn, in the 1149 Hp Solar Saturn Mark II gas turbine Unit 15), any fuel that contains sulfur in excess of 0.8% by weight (ARM 17.8.340 and 40 CFR 60, Subpart GG).

2. Prior to initial start-up of the 1149 Hp Solar Saturn Mark II natural gas fired turbine (Unit 15), WBI – Cabin Creek shall install an NSCR system on the 1109 Hp Waukesha L7042GSIU (Unit 1) (ARM 17.8.749).

3. Prior to initial start-up of the 1149 Hp Solar Saturn Mark II natural gas fired turbine (Unit 15), WBI – Cabin Creek shall permanently modify the stack heights of each of the following units to the indicated minimum stack height requirements (ARM 17.8.749):

Units 1 and 4 =	14.63 meters (m) above ground level
Units 5 through 10 =	14.94 m above ground level

4. WBI - Cabin Creek shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter (ARM 17.8.308).

5. WBI - Cabin Creek shall treat all unpaved portions of the access roads, parking lots, and general plant area with water and/or chemical dust suppressant, as necessary, to maintain compliance with the reasonable precautions limitation in Section II.B.4 (ARM 17.8.749).

6. WBI - Cabin Creek shall operate all equipment to provide the maximum air pollution control for which it was designed (ARM 17.8.752).

7. WBI – Cabin Creek shall comply with all applicable standards, limitations, and the reporting, record keeping, and notification requirements contained in 40 CFR Part 60, Subpart GG (ARM 17.8.340 and 40 CFR 60).

8. Unit #4 (190 hp Ingersol Rand 6XVG) shall be limited to 3500 hours of operation during any rolling 12-month time period (ARM 17.8.749).

C. Testing Requirements:

1. WBI – Cabin Creek shall test the 1149 Hp Solar Saturn Mark II gas fired turbine (Unit 15) for NO_x and CO, concurrently, and demonstrate compliance with the NO_x and CO emission limits contained in Section II.A.2. The compliance source testing shall be conducted within 180 days of initial start-up of the turbine. After the initial source test, additional testing shall be conducted on an every-5-year basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and 17.8.749).

   The compliance source testing and monitoring for the 1149 Hp Solar Saturn Mark II gas fired turbine shall be conducted as specified in 40 CFR 60.334 and 40 CFR 60.335 (40 CFR 60, Subpart GG, ARM 17.8.105, and ARM 17.8.340).

2. WBI – Cabin Creek shall test the 559 hp Waukesha 3521GL generator (GEN1) for NO_x and CO, concurrently, and demonstrate compliance with the NO_x and CO emission limits contained in Section II.A.1. The initial compliance source test was conducted on October 26, 1993 (ARM 17.8.105 and 17.8.749).

3. WBI – Cabin Creek shall test Unit 8, Unit 9, and Unit 10 for NO_x and demonstrate compliance with the NO_x emission limits contained in Section II.A.3 and II.A.4, respectively. The compliance source testing shall be conducted within 180 days of issuance of Permit #2484-03. After the initial source test, additional testing shall be conducted on an every 5-year-basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and 17.8.749).

4. WBI – Cabin Creek shall test the 1109 Hp Waukesha L7042GSIU (Unit 1) for NO_x and CO, concurrently, and demonstrate compliance with the NO_x and CO emission limits contained in Section II.A.5. The compliance source testing shall be conducted within 180 days of initial start-up of the engine after installation of the NSCR system required in Section II.B.2. After the initial source test, additional source testing shall be conducted on an every-5-year basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.105 and 17.8.749).

5. All compliance source tests shall conform to the requirements of the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

6. All source tests shall be performed above 90% of the normal operating capacity of the source.

7. The Department may require further testing (ARM 17.8.105).

D. Operational Reporting Requirement:

1. WBI - Cabin Creek shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the emission inventory contained in the permit analysis.

   Production information shall be gathered on a calendar-year basis and submitted to the Department by the date required in the emission inventory request. Information shall be in the units required by the Department. This information may be used to calculate operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

2. WBI – Cabin Creek shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745(1), that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emission unit. The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).

3. All records compiled in accordance with this permit must be maintained by WBI – Cabin Creek as a permanent business record for at least 5 years following the date of the measurement, must be available at the plant site for inspection by the Department, and must be submitted to the Department upon request (ARM 17.8.749).

4. WBI – Cabin Creek shall comply with all the applicable standards and limitations and the reporting, recordkeeping, and notification requirements of 40 CFR 60, Subpart GG (40 CFR 60, Subpart GG, ARM 17.8.340).

5. For reporting purposes, the equipment should be identified using the source or Unit #s contained in Section I.A of the permit analysis.

6. WBI – Cabin Creek shall document, by month, the annual hours of operation for Unit 4. By the 25th day of each month, WBI – Cabin Creek shall total the hours of operation for Unit 4 during the previous 12 months to verify compliance with the limitation in Section II.B.8. A written report of the compliance verification shall be submitted along with annual emission inventory (ARM 17.8.749).

E. Notification

1. Within 30 days before or after commencement of construction of Unit 15, WBI – Cabin Creek shall notify the Department of the date of commencement of construction (ARM 17.8.749).

2. Within 15 days after the actual startup date of Unit 15, WBI – Cabin Creek shall notify the Department of the date of actual startup (ARM 17.8.749).

3. Within 30 days before or after commencement of construction of the stack height modifications required in Section II.B.3, WBI – Cabin Creek shall notify the Department of the date of commencement of construction (ARM 17.8.749).

4. Within 15 days after the actual stack height modifications required in Section II.B.3 are made, WBI – Cabin Creek shall notify the Department of the actual date of completion (ARM 17.8.749).

5. Within 30 days before or after commencement of construction of the NSCR system for Unit 1, WBI – Cabin Creek shall notify the Department of the date of commencement of construction (ARM 17.8.749).

6. Within 15 days after the actual date the NSCR system is installed on Unit 1, WBI – Cabin Creek shall notify the Department of the date of actual installation (ARM 17.8.749).

III. General Conditions

A. Inspection – WBI - Cabin Creek shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed

accepted if WBI - Cabin Creek fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving WBI - Cabin Creek of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders it's decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The Department's decision on the application is not final unless 15 days have elapsed and there is no request for a hearing under this section. The filing of a request for a hearing postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by WBI - Cabin Creek may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Construction Commencement – Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).

Permit Analysis
Williston Basin Interstate Pipeline Company
Cabin Creek Compressor Station
Permit #2484-03

I. Introduction/Process Description

A. Permitted Equipment

The following table includes a complete list of permitted equipment at the Williston Basin Interstate Pipeline – Cabin Creek Compressor Station (WBI – Cabin Creek).

Unit #	Year Installed	Make	Model	Capacity	Source #
1	1977	Waukesha	L7042GSU	1109 Hp	01
4	1936	Ingersoll - Rand	6XVG	190 Hp	04
5	1937	Ingersoll - Rand	8XVG	300 Hp	05
6	1939	Ingersoll - Rand	8XVG	300 Hp	06
7	1939	Ingersoll - Rand	8XVG	300 Hp	07
8	1956	Ingersoll - Rand	12SVG	660 Hp	08
9	1959	Ingersoll - Rand	48KVG	880 HP	09
10	1960	Ingersoll - Rand	48KVG	880 Hp	10
11	1971	Solar	Saturn Ph. IV	1100 Hp	11
12	1971	Solar	Saturn Ph. IV	1100 Hp	12
13	1971	Solar	Saturn Ph. IV	1100 Hp	13
14	1975	Solar	Saturn Ph. II	1200 Hp	14
15	2003	Solar	Saturn Mark II	1149 Hp	15
16	1975	Solar	Centaur	3800 Hp	16
Generator 1	1992	Waukesha	3521 GL	559 Hp	17
Dehydrator Heater				15.25 MMBtu/hr	18
Boiler		Mueller	Climatetrol205-14	819 MBtu/hr	19
Boiler		Mueller	Climatetrol215-12	770 MBtu/hr	20
Heater		Eclipse	D-6	450 MBtu/hr	21
Heater		Bryant	246-15	1.47 MBtu/hr	22

B. Source Description

The compressor station is used to compress natural gas to the required pressure for transportation within the natural gas transmission system. Compression of the gas is accomplished using the compressors described above.

A dry-bead dehydration unit is used to remove liquid water and/or water vapor from the produced natural gas stream to prevent the formation of hydrates in the transmission lines. Dehydration is also necessary in order to meet water dew point requirements of the gas sales contract.

C. Permit History

On May 31, 1988, WBI - Cabin Creek was issued a permit for the operation of the Cabin Creek compressor station consisting of 16 natural gas compressor engines, located in the SE¼ of the SE¼ of Section 16, Township 10 North, Range 58 East, Fallon County,

Montana. The application was given **Permit #2484**.
On July 17, 1992, WBI - Cabin Creek was issued a permit to replace an existing 1961 Waukesha 1197G generator engine (248 hp) with a 1992 Waukesha 3521GL generator engine (544 hp) at their Cabin Creek facility. The old engine was removed. The application was given **Permit #2484-01**.

The Department of Environmental Quality (Department) BACT determination for Permit #2484-01 was the use of a Waukesha, Model 3521GL Lean Combustion gas engine with emission factors of 2.0, 2.0, and 1.0 grams/bhp-hr for NOx, CO, and VOC, respectively.

WBI - Cabin Creek applied for a permit alteration to increase the permitted operational horsepower and the CO emission rate for the 1992 Waukesha 3512GL generator engine (544 hp). The engine was originally permitted to operate at 1200 rpm and the corresponding CO emission rate of 2.0 gram/hp-hr. The actual installed horsepower of the engine/generator set was site rated at 559 hp and limited to 900 rpm. This de-torquing of an engine generally increases the CO emissions; therefore, WBI - Cabin Creek could only achieve the manufacturer's guaranteed emissions under limited conditions. This emission rate was also due to increase as a result of site specific fuel analysis quality. WBI - Cabin Creek submitted a revised manufacturer's emission guarantee for CO of 3.3 gram/hp-hr based on the results of a site specific fuel analysis.

WBI - Cabin Creek also requested that the permitted emission limits be expressed in pounds per hour (lb/hr) rather than grams per horsepower-hour (gram/hp-hr), which is consistent with the Department's revised guidelines. The revision to the guidelines for developing an emission limitation is due to varying parameters such as engine RPM, operating load (bhp), ambient air temperature, gas temperature, site elevation, fuel gas quality, air/fuel ratio (AFR), field gas conditions, etc. Rather than limit the engine to a gram/hp-hr limit, the hourly emission limit allowed for needed operational flexibility. Montana Air Quality Permit **#2484-02** replaced Permit #2484-01.

D. Current Permit Action

On March 21, 2003, the Department received a complete permit application from WBI – Cabin Creek for the installation and operation of an 1149 horsepower (hp) capacity natural gas fired turbine. WBI – Cabin Creek is a major stationary source of emissions as defined under the New Source Review Prevention of Significant Deterioration (PSD) program; however, potential emissions from the proposed turbine do not exceed any PSD significant emission thresholds and the current permit action does not trigger PSD review.

Further, WBI – Cabin Creek submitted a modeling analysis including annual NO_x ambient air impacts as well as 1- and 8-hour CO ambient impacts from the proposed turbine. A summary of modeled impacts is contained in Section VI of the permit analysis for the current permit action. Based on the ambient air modeling results initially submitted by WBI – Cabin Creek, and in accordance with the Department's "Monitoring Requirements" guidance document (October 9, 1998), the WBI – Cabin Creek facility, as initially proposed, would be required to conduct ambient monitoring because the modeled NO_2 concentration was above 95% of the ambient standard.

Subsequently, WBI – Cabin Creek submitted a letter to the Department requesting various permit changes to keep the source emission impacts below the applicable ambient standards for NO_x and to avoid the requirement for ambient NO_x monitoring. Specifically, under the current permit action, WBI – Cabin Creek is required to install a

non-selective catalytic reduction system (NSCR) on Unit 1, raise the stack heights on Unit 1 and Units 4 through 10, lower the allowable NO_x emission rates for Units 8 through 10, and limit the operating hours for Unit 4 to 3500 hours during any rolling 12-month time period. Permit #2484-03 includes conditional requirements for all previously cited equipment/operational modifications.

Furthermore, WBI – Cabin Creek requested that the Department modify the testing schedule for the 559 hp Waukesha 3521GL (GEN1). Currently, based on Department source testing guidance, WBI – Cabin Creek is required to test GEN1 on an every-4-year schedule. However, the Title V operating permit for WBI – Cabin Creek requires semiannual testing for this unit. Therefore, at the request of WBI – Cabin Creek, the testing requirements for GEN1 have been modified to incorporate language allowing for consistency between the Montana Air Quality Permit and the Title V operating permit source testing schedules for this unit.

Finally, the Department updated all rule references to reflect recent rule revisions. Permit **#2484-03** replaces Permit #2484-02.

E. Additional Information

Additional information, such as applicable rules and regulations, Best Available Control Technology (BACT)/Reasonably Available Control Technology (RACT) determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit.

II. Applicable Rules and Regulations

The following are partial explanations of some applicable rules and regulations that apply to the facility. The complete rules are stated in the Administrative Rules of Montana (ARM) and are available, upon request, from the Department. Upon request, the Department will provide references for location of complete copies of all applicable rules and regulations or copies where appropriate.

A. ARM 17.8, Subchapter 1 – General Provisions, including but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment (including instruments and sensing devices) and shall conduct tests, emission or ambient, for such periods of time as may be necessary using methods approved by the Department.

   The initial application for Montana Air Quality Permit #2484-03 included a modeling demonstration which showed an exceedance of applicable NO_x standards, as initially proposed. Subsequently, WBI – Cabin Creek proposed equipment modifications (i.e., increased stack heits), lower NO_x emission limits, and operating restrictions for various equipment at the facility to demonstrate compliance with the applicable NO_x standards through modeling. Therefore, under the current permit action, the Department included specific NO_x emission limits and testing requirements to demonstrate compliance with those NO_x limits modeled to demonstrate compliance

with the applicable NO_x standards.
Further, in addition to operating under Montana Air Quality Permit #2484-03, WBI – Cabin Creek operates under major source Title V Operating Permit #OP2484-00. The Title V operating permit includes source-testing requirements on a semiannual basis; therefore, under the current permit action, because the Title V testing schedule requires more frequent testing, the Department removed (from the Montana Air Quality Permit) the every-4-year testing requirements for various units.

The Department shall determine if initial compliance source testing is required for any sources installed under the provisions of ARM 17.8.745(l) to demonstrate compliance with applicable emission limits (ARM 17.8.105 and ARM 17.8.749).

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

   WBI - Cabin Creek shall comply with the requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means that, without resulting in reduction of the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner as to create a public nuisance.

B. ARM 17.8, Subchapter 2 – Ambient Air Quality, including, but not limited to the following:

1. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
2. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
3. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
4. ARM 17.8.213 Ambient Air Quality Standard for Ozone
5. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
6. ARM 17.8.221 Ambient Air Quality Standard for Visibility
7. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

WBI - Cabin Creek must maintain compliance with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 – Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, WBI - Cabin Creek shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.340 Standard of Performance for New Stationary Sources and Emission Guidelines for Existing Sources. This rule incorporates, by reference, 40 CFR 60, Standards of Performance for New Stationary Sources (NSPS). WBI – Cabin Creek is an NSPS affected facility under 40 CFR 60 and is subject to the requirements of Subpart GG, Standards of Performance for Stationary Gas Turbines. All standards and limitations and the reporting, recordkeeping, and notification requirements of 40 CFR 60, Subpart GG, apply to the 1149 Hp Solar Saturn Mark II natural gas fired turbine, as applicable.

6. ARM 17.8.342 Emission Standards for Hazardous Air Pollutants for Source Categories. The source, as defined and applied in 40 CFR 63, is not subject to the requirements of 40 CFR 63, as specifically discussed below:

   40 CFR 63, Subpart HH-National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities. Owners or operators of oil and natural gas production facilities, as defined and applied in 40 CFR Part 63, shall comply with the standards and provisions of 40 CFR Part 63, Subpart HH. The Department determined that 40 CFR Part 63, Subpart HH, does not apply to the WBI – Cabin Creek facility because it is not a major source of HAPs.

   40 CFR 63, Subpart HHH-National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities. Owners or operators of natural gas transmission or storage facilities, as defined and applied in 40 CFR Part 63, shall comply with the standards and provisions of 40 CFR Part 63, Subpart HHH. The Department determined that 40 CFR Part 63, Subpart HHH, does not apply to the WBI – Cabin Creek facility because it is not a major source of HAPs.

D. ARM 17.8, Subchapter 5 – Air Quality Permit Application, Operation and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. WBI - Cabin Creek submitted the appropriate permit application fee for the current permit action.

2. ARM 17.8.505 When Permit Required--Exclusions. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit (excluding an open burning permit) issued by the Department. The air quality operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that prorate the required fee amount.

E. ARM 17.8, Subchapter 7 – Permit, Construction and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a facility to obtain an air quality permit or permit modification if they construct, alter or use any air contaminant sources that have the potential to emit greater than 25 tons per year of any pollutant. WBI – Cabin Creek has the potential to emit more than 25 tons per year of NO_x, VOC, and CO; therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits—Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that are not subject to the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, alteration or use of a source. WBI – Cabin Creek submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. WBI – Cabin Creek submitted an affidavit of publication of public notice for the November 8, 2002, issue of the *Fallon County Times*, a newspaper of general circulation in the Town of Baker in

Fallon County, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section III of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving WBI – Cabin Creek of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or altered source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745 for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8 – Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow.

   This facility is not a listed source, but emissions are greater than or equal to 250 tons per year; therefore, the facility is a major source of emissions, as defined under the New Source Review Prevention of Significant Deterioration (PSD) permitting program. The current permit modification will not cause a net emission increase greater than any applicable PSD significance level; therefore, addition of the 1149 Hp Solar Saturn Mark II natural gas fired turbine does not require PSD analysis. The net emission changes are as follows:

Source – 1149 Hp Solar Saturn Mark II Natural Gas Fired Turbine		
Pollutant	PSD Significance Level (tons/year)	Potential To Emit (tons/year)
CO	100	33.28
NO_x	40	22.19
VOC	40	11.09
PM/PM_{10}	25/15	0.34/0.34
SO_x	40	0.39

G. ARM 17.8, Subchapter 12 – Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any source having:

   a. Potential to Emit (PTE) > 100 tons/year of any pollutant;

   b. PTE > 10 tons/year of any one Hazardous Air Pollutant (HAP), PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

   c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program. (1) Title V of the FCAA amendments of 1990 requires that all sources, as defined in ARM 17.8.1204(1), obtain a Title V Operating Permit. In reviewing and issuing Montana Air Quality Permit #2484-03 for WBI - Cabin Creek, the following conclusions were made.

   a. The facility's PTE is greater than 100 tons/year for NO_x,CO, and VOC.

   b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.

c. This source is not located in a serious PM_{10} nonattainment area.

d. This facility is subject to the NSPS requirements in 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, as applicable to the facility.

e. This facility is not subject to any current NESHAP standards.

f. This source is not a Title IV affected source, nor a solid waste combustion unit.

g. This source is not an EPA designated Title V source.

Based on these facts, the Department determined that WBI – Cabin Creek is subject to the Title V operating permit program. Title V Operating Permit #OP2484-00 was issued final and effective on August 23, 1998. Further, the current permit action constitutes a significant modification to Title V Operating Permit #OP2484-00; therefore, in accordance with ARM 17.8.1227, WBI – Cabin Creek submitted a permit application for a significant modification to Title V Operating Permit #OP2484-00 concurrently with the Montana Air Quality Permit application submitted for the current permit action.

III. BACT Determination

A BACT determination is required for each new or altered source. WBI – Cabin Creek shall install on the new or altered source the maximum air pollution control capability, which is technically practicable and economically feasible, except that BACT shall be utilized. Based on similar source BACT review and the Department's "Revised BACT Guidelines" for stationary compressor engines and turbines, the Department analyzed NO_x, CO, and VOC emissions from the proposed turbine.

A. NO_x Emissions

NO_x emissions from the proposed turbine will be produced primarily by thermal NO_x formation with some influence by prompt and fuel bound NO_x formation. Thermal NO_x results when the intense heat of combustion causes atmospheric nitrogen to combine with atmospheric oxygen (O_2). Maximum NO_x production occurs at a lean fuel to air ratio due to excess oxygen available for reaction with nitrogen in the air and fuel.

The following NO_x control strategies/technologies were reviewed for the current permit action:

- Wet Controls;
- Selective Catalytic Reduction (SCR); and
- Dry Low NO_x Combustors.

Wet Controls

Wet controls inject water, steam, or water-in-oil emulsion into a flame area of the turbine combustor to act as an inert diluent that lowers the peak flame temperature. Lowering the flame temperature limits thermal NO_x emissions but does not reduce fuel NO_x formation. In fact, wet controls may actually increase the rate of fuel NO_x formation. Controlled NO_x emissions are a function of the amount of water injected and of the nitrogen content of the fuel. NO_x control capabilities are limited by the need to increase water-to-fuel ratios for increased emissions reductions.

Further, wet controls present several potentially adverse environmental impacts. These impacts include a need for a water treatment plant with associated wastewater effluent, increased hydrocarbon and CO emissions from high water-to-fuel ratios, a reduction in turbine fuel efficiency resulting in additional fuel combustion, and although water injection limits thermal NO_x, fuel NO_x formation can actually increase.

Selective Catalytic Reduction (SCR)

SCR is a post-combustion gas treatment technique that uses a catalyst to reduce NO and NO_2 to molecular nitrogen, oxygen, and water. Ammonia (NH_3) is commonly used as the reducing agent.

NH_3 is vaporized and injected into the flue gas upstream of the catalyst bed. The NH_3 combines with the NO_x at the catalyst surface to form an ammonium salt intermediate. The ammonium salt intermediate then decomposes to produce elemental nitrogen and water.

The catalyst lowers the temperature required for the chemical reaction between NO_x and NH_3. Catalysts used for NO_x reduction can include base metals, precious metals, and zeolites. Commonly, the catalyst is a mixture of titanium and vanadium oxides.

An attribute common to all catalysts is the narrow "window" of acceptable system temperatures. In this case, the temperature "window" is approximately 575 to 800ºF. Below 575ºF, the NO_x reduction reaction will not proceed, while operation above 800ºF will shorten catalyst life and can lead to the oxidation of NH_3 to either nitrogen oxides or possibly generating explosive levels of ammonium nitrate in the exhaust gas.

Technical factors that impact the effectiveness of this technology include the catalyst reactor design, operating temperature, type of fuel fired, sulfur content of the fuel, design of the NH_3 injection system, and the potential for catalyst poisoning.

Dry Low NO_x Combustors

Dry low NO_x combustion systems reduce NO_x formation by controlling the mixing of fuel and air to provide low excess air firing or off-stoichiometric combustion. These burners are designed to reduce peak flame temperature and/or reduce the residence time at high temperatures. In all gas turbines, the high temperature combustion gases are cooled with dilution air which is added sooner than with standard combustors. This dilution air promptly cools the hot gases to temperatures below the thermal NO_x formation threshold.

NOx BACT Summary

The previously discussed NO_x control technologies/strategies are all effective in reducing NO_x emissions from natural gas fired turbines such as that proposed under the current permit action. Based on the Department's "Revised BACT Guidelines" for operating natural gas fired compressor engines and turbines, the Department considers a NO_x emission rate less than or equal to 2.0 grams per brake horsepower-hour (bHp-hr) to be BACT for turbines in the subject turbine size category.

B. CO Emissions

CO emissions result from insufficient residence time at high temperatures or incomplete mixing to complete the final step in fuel carbon oxidation. In an ideal combustion process, all of the carbon and hydrogen contained within the fuel are oxidized to form carbon dioxide (CO_2) and water (H_2O). Emission of CO in a combustion process is the result of incomplete organic fuel combustion. CO emissions can be caused by; poor fuel-air mixing, flame quenching, and low residence time.

The following CO control strategies/technologies were reviewed for the current permit action:

- CO oxidation catalysts; and
- Oxidation of Post Combustion Gases.

CO Oxidation Catalysts

CO oxidation catalysts are often used to control CO emissions from natural gas fired turbines. The catalyst is usually made from a precious metal such as platinum, palladium, or rhodium. Other formulations, such as metal oxides for emission streams containing chlorinated compounds, are also used. The CO catalyst promotes the oxidation of CO and hydrocarbon compounds to CO_2 and H_2O as the emission stream passes through the catalyst bed. The oxidation process takes place spontaneously, without the requirement of introducing reactants. The performance of these catalyst systems on combustion turbines results in 90%-plus reduction of CO.

Oxidation of Post Combustion Gases

Oxidizers or incinerators use heat to destroy CO in the gas stream. Oxidation controls, like combustion processes, ideally break down the molecular structure of an organic compound into CO_2 and H_2O. Temperature, residence time, and turbulence of the system affect CO control efficiency. Incinerators have a potential for very effective CO control; however, this efficiency comes at the expense of increasing NO_x production.

CO BACT Summary

The previously discussed CO control strategies are both effective in reducing CO emissions from natural gas fired turbines such as that proposed under the current permit action. Based on the Department's "Revised BACT Guidelines" for operating natural gas fired compressor engines and turbines, the Department considers a CO emission rate less than or equal to 3.0 grams per brake horsepower-hour (bHp-hr) to be BACT for turbines in the subject turbine size category.

C. VOC Emissions

Like CO emissions, VOC emissions result from incomplete combustion. The pollutants, which are commonly classified as VOCs, encompass a wide spectrum of compounds some of which are considered HAPs. These compounds are released into the atmosphere when some of the fuel remains unburned or is only partially burned during the combustion process. With natural gas, some organics are carried over as unreacted, trace constituents of the gas, while others may be pyrolysis products of the heavier hydrocarbon constituents.

CO/VOC Oxidation Catalyst

Again, as for CO emissions, CO oxidation catalysts are also being used to control VOC and HAP emissions through the same processes. The performance of these catalyst systems on combustion turbines results in about 85-90% control of VOCs and some HAPs.

VOC BACT Summary

The previously discussed CO/VOC control strategy is effective in reducing VOC emissions from natural gas fired turbines such as that proposed under the current permit action. Based on the Department's "Revised BACT Guidelines" for operating natural gas fired compressor engines and turbines, the Department considers a VOC emission rate less than or equal to 1.0 gram per brake horsepower-hour (bHp-hr) to be BACT for turbines in the subject turbine size category

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

IV. Emission Inventory

	tons per year					
Source – Source Number	**PM**	**PM_{10}**	**NO_x**	**VOC**	**CO**	**SO_x**
1109 Hp Waukesha – #1	0.35	0.35	21.37	0.80	106.89	0.02
190 Hp Ingersoll Rand – #4	0.00	0.00	5.49	0.73	24.14	0.00
300 Hp Ingersoll Rand – #5	0.13	0.13	21.68	2.89	95.40	0.01
300 Hp Ingersoll Rand – #6	0.13	0.13	21.68	2.89	95.40	0.01
300 Hp Ingersoll Rand – #7	0.13	0.13	21.68	2.89	95.40	0.01
660 Hp Ingersoll Rand – #8	0.29	0.29	76.48	4.77	4.13	0.01
880 Hp Ingersoll Rand – #9	0.31	0.31	101.97	11.02	5.34	0.02
880 Hp Ingersoll Rand – #10	0.31	0.31	101.97	11.02	5.34	0.02
1100 Hp Solar – #11	0.60	0.60	21.20	7.95	10.60	0.02
1100 Hp Solar – #12	0.60	0.60	21.20	7.95	10.60	0.02
1100 Hp Solar – #13	0.60	0.60	21.20	7.95	10.60	0.02
1200 Hp Solar – #14	0.66	0.66	23.13	8.67	11.56	0.02
1149 Hp Solar - #15	0.34	0.34	22.19	11.09	33.28	0.39
3800 Hp Solar – #16	1.17	1.17	67.45	25.29	33.73	0.07
559 Hp Waukesha – #17	0.19	0.19	10.77	5.39	17.78	0.01
Dehydrator Heater – #18	0.88	0.88	9.00	0.37	2.25	0.04
Mueller Boiler – #19	0.04	0.04	0.35	0.02	0.07	0.00
Mueller Boiler – #20	0.04	0.04	0.32	0.02	0.07	0.00
Eclipse Heater – #21	0.02	0.02	0.19	0.01	0.04	0.00
Bryant Heater – #22	0.08	0.08	0.87	0.04	0.22	0.00
Total Potential Emissions	**6.87**	**6.87**	**570.19**	**111.76**	**562.84**	**0.69**

1109 Waukesha, #1

Brake Horsepower: 1109 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 7300 Btu/hp-hr (Information from company)
7300 Btu/hp-hr * 0.001 ft^3/btu * 1109 hp * 8760 hr/yr = 7E+07 ft^3/yr
Calculations: 70918332 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.35 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 7300 Btu/hp-hr (Information from company)
7300 Btu/hp-hr * 0.001 ft^3/btu * 1109 hp * 8760 hr/yr = 7E+07 ft^3/yr
Calculations: 70918332 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.35 ton/yr

NOx Emissions:

Emission factor: 2.00 gram/bhp-hr (Information from company)
Calculations: 2.00 gram/bhp-hr * 1109 bhp * 0.00220 lb/gram * 8760 hr/yr /2000 = 21.37 ton/yr

VOC Emissions:

Emission factor: 0.075 gram/bhp-hr (Information from company)
Calculations: 0.075 gram/bhp-hr * 1109 bhp* 0.0022 lb/gram * 8760 hr/yr /2000= 0.80 ton/yr

CO Emissions:

Emission factor: 10.00 gram/bhp-hr (Permit Application #OP2484-00)
Calculations: 10.00 gram/bhp-hr * 1109 bhp* 0.0022 lb/gram* 8760 hr/yr /2000 =106.89 ton/yr

- Prior to Permit #2484-03 the CO emission rate in the permit emission inventory was incorrectly referenced as 1.0 g/hp-hr. WBI – Cabin Creek reported a CO emission rate of 10.0 g/hp-hr in the respective permit applications.

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 1109 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.02 ton/yr

190 Ingersoll Rand, #4

Brake Horsepower: 190 bhp
Hours of operation: 3500 hr/yr (Permit Limit)

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 10000 Btu/hp-hr (Application 1988)
10000 Btu/hp-hr * 0.001 ft^3/btu * 190 hp * 3500 hr/yr = 6.65E06 ft^3/yr
Calculations: 6.65E06 ft^3/yr * 10 lbs/10^6 ft^3 gas * 0.0005 ton/lb = 0.0033 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 10000 Btu/hp-hr (Application 1988)
10000 Btu/hp-hr * 0.001 ft^3/btu * 190 hp * 3500 hr/yr = 6.65E06 ft^3/yr
Calculations: 6.65E06 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.0033 ton/yr

NOx Emissions:

Emission factor: 7.5 gram/bhp-hr (Information from company)
Calculations: 7.5 gram/bhp-hr * 190 bhp* 0.0022 lb/gram* 3500 hr/yr /2000 = 5.49 ton/yr

VOC Emissions:

Emission factor: 1.00 gram/bhp-hr (Information from company)
Calculations: 1.00 gram/bhp-hr* 190 bhp* 0.0022 lb/gram* 3500 hr/yr /2000= 0.73 ton/yr

CO Emissions:

Emission factor: 33.00 gram/bhp-hr (Information from company)
Calculations: 33 gram/bhp-hr * 190 bhp* 0.0022 lb/gram* 3500 hr/yr /2000 = 24.14 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 190 bhp * 0.0022 lb/gram * 3500 hr/yr /2000 = 0.0015 ton/yr

300 Ingersoll Rand, #5

Brake Horsepower: 300 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 10000 Btu/hp-hr (Application 1988)
10000 Btu/hp-hr * 0.001 ft^3/btu * 300 hp * 8760 hr/yr = 3E+07 ft^3/yr
Calculations: 26280000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.13 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 10000 Btu/hp-hr (Application 1988)
10000 Btu/hp-hr * 0.001 ft^3/btu * 300 hp * 8760 hr/yr = 3E+07 ft^3/yr
Calculations: 26280000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.13 ton/yr

NO_x Emissions:

Emission factor: 7.5 gram/bhp-hr (Information from company)
Calculations: 7.5 gram/bhp-hr * 300 bhp * 0.00220 lb/gram * 8760 hr/yr /2000 = 21.68 ton/yr

VOC Emissions:

Emission factor: 1.00 gram/bhp-hr (Information from company)
Calculations: 1.00 gram/bhp-hr* 300 bhp* 0.0022 lb/gram * 8760 hr/yr /2000= 2.89 ton/yr

CO Emissions:

Emission factor: 33.00 gram/bhp-hr (Information from company)
Calculations: 33.00 gram/bhp-hr * 300 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 95.40 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr 300 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.01 ton/yr

300 Ingersoll Rand, #6

Brake Horsepower: 300 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 10000 Btu/hp-hr (Application 1988)
10000 Btu/hp-hr * 0.001 ft^3/btu * 300 hp * 8760 hr/yr = 3E+07 ft^3/yr
Calculations: 26280000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.13 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 10000 Btu/hp-hr (Application 1988)
10000 Btu/hp-hr * 0.001 ft^3/btu * 300 hp * 8760 hr/yr = 3E+07 ft^3/yr
Calculations: 26280000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.13 ton/yr

NOx Emissions:

Emission factor: 7.5 gram/bhp-hr (Information from company)
Calculations: 7.5 gram/bhp-hr * 300 bhp * 0.00220 lb/gram * 8760 hr/yr /2000 = 21.68 ton/yr

VOC Emissions:

Emission factor: 1.00 gram/bhp-hr (Information from company)
Calculations: 1.00 gram/bhp-hr* 300 bhp* 0.0022 lb/gram * 8760 hr/yr /2000= 2.89 ton/yr

CO Emissions:

Emission factor: 33.00 gram/bhp-hr (Information from company)
Calculations: 33.00 gram/bhp-hr * 300 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 95.40 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 300 bhp * 0.0022 lb/gram * 8760 hr/yr /2000= 0.01 ton/yr

300 Ingersoll Rand, #7

Brake Horsepower: 300 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 10000 Btu/hp-hr (Application 1988)
10000 Btu/hp-hr * 0.001 ft^3/btu * 300 hp * 8760 hr/yr = 3E+07 ft^3/yr
Calculations: 26280000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.13 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 10000 Btu/hp-hr (Application 1988)
10000 Btu/hp-hr * 0.001 ft^3/btu * 300 hp * 8760 hr/yr = 3E+07 ft^3/yr
Calculations: 26280000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.13 ton/yr

NOx Emissions:

Emission factor: 7.5 gram/bhp-hr (Information from company)
Calculations: 7.5 gram/bhp-hr * 300 bhp * 0.00220 lb/gram * 8760 hr/yr /2000 = 21.68 ton/yr

VOC Emissions:

Emission factor: 1.00 gram/bhp-hr (Information from company)
Calculations: 1.00 gram/bhp-hr* 300 bhp* 0.0022 lb/gram * 8760 hr/yr /2000= 2.89 ton/yr

CO Emissions:

Emission factor: 33.00 gram/bhp-hr (Information from company)
Calculations: 33.00 gram/bhp-hr * 300 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 95.40 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 300 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.01 ton/yr

660 Ingersoll Rand, #8

Brake Horsepower: 660 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 10000 Btu/hp-hr (Application 1988)
10000 Btu/hp-hr * 0.001 ft^3/btu * 660 hp * 8760 hr/yr = 6E+07 ft^3/yr
Calculations: 57816000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.29 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 10000 Btu/hp-hr (Application 1988)
10000 Btu/hp-hr * 0.001 ft^3/btu * 660 hp * 8760 hr/yr = 6E+07 ft^3/yr
Calculations: 57816000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.29 ton/yr

NOx Emissions:

Emission factor: 17.46 lb/hr (Permit Limit)
Calculations: 17.46 lb/hr * 8760 hr/yr / 2000 = 76.48 ton/yr

VOC Emissions:

Emission factor: 0.75 gram/bhp-hr (Information from company)
Calculations: 0.75 gram/bhp-hr* 660 bhp* 0.0022 lb/gram * 8760 hr/yr /2000= 4.77 ton/yr

CO Emissions:

Emission factor: 0.65 gram/bhp-hr (Information from company)
Calculations: 0.65 gram/bhp-hr * 660 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 4.13 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 660 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.01 ton/yr

880 Ingersoll Rand, #9

Brake Horsepower: 880 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 8000 Btu/hp-hr (Application 1988)
8000 Btu/hp-hr * 0.001 ft^3/btu * 880 hp * 8760 hr/yr = 6E+07 ft^3/yr
Calculations: 61670400 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.31 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 8000 Btu/hp-hr (Application 1988)
8000 Btu/hp-hr * 0.001 ft^3/btu * 880 hp * 8760 hr/yr = 6E+07 ft^3/yr
Calculations: 61670400 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.31 ton/yr

NOx Emissions:

Emission factor: 23.28 lb/hr (Permit Limit)
Calculations: 23.28 lb/hr * 8760 hr/yr / 2000 = 101.97 ton/yr

VOC Emissions:

Emission factor: 1.30 gram/bhp-hr (Information from company)
Calculations: 1.30 gram/bhp-hr* 880 bhp* 0.0022 lb/gram * 8760 hr/yr /2000= 11.02 ton/yr

CO Emissions:

Emission factor: 0.63 gram/bhp-hr (Information from company)
Calculations: 0.63 gram/bhp-hr * 880 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 5.34 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 880 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.02 ton/yr

880 Ingersoll Rand, #10

Brake Horsepower: 880 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 8000 Btu/hp-hr (Application 1988)
8000 Btu/hp-hr * 0.001 ft^3/btu * 880 hp * 8760 hr/yr = 6E+07 ft^3/yr
Calculations: 61670400 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.31 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 8000 Btu/hp-hr (Application 1988)
8000 Btu/hp-hr * 0.001 ft^3/btu * 880 hp * 8760 hr/yr = 6E+07 ft^3/yr
Calculations: 61670400 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.31 ton/yr

NOx Emissions:

Emission factor: 23.28 lb/hr (Permit Limit)
Calculations: 23.28 lb/hr * 8760 hr/yr / 2000 = 101.97 ton/yr

VOC Emissions:

Emission factor: 1.30 gram/bhp-hr (Information from company)
Calculations: 1.30 gram/bhp-hr* 880 bhp* 0.0022 lb/gram * 8760 hr/yr /2000= 11.02 ton/yr

CO Emissions:

Emission factor: 0.63 gram/bhp-hr (Information from company)
Calculations: 0.63 gram/bhp-hr * 880 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 5.34 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 880 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.02 ton/yr

1100 Solar, #11

Brake Horsepower: 1100 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 12500 Btu/hp-hr (Application 1988)
12500 Btu/hp-hr * 0.001 ft^3/btu * 1100 hp * 8760 hr/yr = 1E+08 ft^3/yr
Calculations: 120450000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.60 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 12500 Btu/hp-hr (Application 1988)
12500 Btu/hp-hr * 0.001 ft^3/btu * 1100 hp * 8760 hr/yr = 1E+08 ft^3/yr
Calculations: 120450000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.60 ton/yr

NOx Emissions:

Emission factor: 2.0 gram/bhp-hr (Information from company)
Calculations: 2.0 gram/bhp-hr * 1100 bhp * 0.00220 lb/gram * 8760 hr/yr /2000 = 21.20 ton/yr

VOC Emissions:

Emission factor: 0.75 gram/bhp-hr (Information from company)
Calculations: 0.75 gram/bhp-hr* 1100 bhp* 0.0022 lb/gram * 8760 hr/yr /2000= 7.95 ton/yr

CO Emissions:

Emission factor: 1.00 gram/bhp-hr (Information from company)
Calculations: 1.00 gram/bhp-hr * 1100 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 10.60 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1,9/85)
Calculations: 0.002 gram/hp-hr * 1100 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.02 ton/yr

1100 Solar, #12

Brake Horsepower: 1100 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 12500 Btu/hp-hr (Application 1988)
12500 Btu/hp-hr * 0.001 ft^3/btu * 1100 hp * 8760 hr/yr = 1E+08 ft^3/yr
Calculations: 120450000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.60 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 12500 Btu/hp-hr (Application 1988)
12500 Btu/hp-hr * 0.001 ft^3/btu * 1100 hp * 8760 hr/yr = 1E+08 ft^3/yr
Calculations: 120450000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.60 ton/yr

NOx Emissions:

Emission factor: 2.0 gram/bhp-hr (Information from company)
Calculations: 2.0 gram/bhp-hr * 1100 bhp * 0.00220 lb/gram * 8760 hr/yr /2000 = 21.20 ton/yr

VOC Emissions:

Emission factor: 0.75 gram/bhp-hr (Information from company)
Calculations: 0.75 gram/bhp-hr* 1100 bhp* 0.0022 lb/gram * 8760 hr/yr /2000 = 7.95 ton/yr

CO Emissions:

Emission factor: 1.00 gram/bhp-hr (Information from company)
Calculations: 1.00 gram/bhp-hr * 1100 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 10.60 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 1100 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.02 ton/yr

1100 Solar, #13

Brake Horsepower: 1100 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 12500 Btu/hp-hr (Application 1988)
12500 Btu/hp-hr * 0.001 ft^3/btu * 1100 hp * 8760 hr/yr = 1E+08 ft^3/yr
Calculations: 120450000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.60 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 12500 Btu/hp-hr (Application 1988)
12500 Btu/hp-hr * 0.001 ft^3/btu * 1100 hp * 8760 hr/yr = 1E+08 ft^3/yr
Calculations: 120450000 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.60 ton/yr

NOx Emissions:

Emission factor: 2.0 gram/bhp-hr (Information from company)
Calculations: 2.0 gram/bhp-hr * 1100 bhp * 0.00220 lb/gram * 8760 hr/yr /2000 = 21.20 ton/yr

VOC Emissions:

Emission factor: 0.75 gram/bhp-hr (Information from company)
Calculations: 0.75 gram/bhp-hr* 1100 bhp* 0.0022 lb/gram * 8760 hr/yr /2000 = 7.95 ton/yr

CO Emissions:

Emission factor: 1.00 gram/bhp-hr (Information from company)
Calculations: 1.00 gram/bhp-hr * 1100 bhp* 0.0022 lb/gram* 8760 hr/yr /2000 = 10.60 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1. 9/85)
Calculations: 0.002 gram/hp-hr * 1100 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.02 ton/yr

1200 Solar, #14

Brake Horsepower: 1200 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 12550 Btu/hp-hr (Application 1988)
12550 Btu/hp-hr * 0.001 ft^3/btu * 1200 hp * 8760 hr/yr = 1E+08 ft^3/yr
Calculations: 131925600 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.66 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 12550 Btu/hp-hr (Application 1988)
12550 Btu/hp-hr * 0.001 ft^3/btu * 1200 hp * 8760 hr/yr = 1E+08 ft^3/yr
Calculations: 131925600 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.66 ton/yr

NOx Emissions:

Emission factor: 2.0 gram/bhp-hr (Information from company)
Calculations: 2.0 gram/bhp-hr * 1200 bhp * 0.00220 lb/gram * 8760 hr/yr /2000 = 23.13 ton/yr

VOC Emissions:

Emission factor: 0.75 gram/bhp-hr (Information from company)
Calculations: 0.75 gram/bhp-hr* 1200 bhp* 0.0022 lb/gram * 8760 hr/yr /2000= 8.67 ton/yr

CO Emissions:

Emission factor: 1.00 gram/bhp-hr (Information from company)
Calculations: 1.00 gram/bhp-hr * 1200 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 11.56 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 1200 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.02 ton/yr

1149 Solar, #15

Brake Horsepower: 1149 bhp (Manufacturers Information)
Hours of operation: 8760 hr/yr
Heat Input Capacity: 11.7 MMBtu/hr (Company Information)

PM Emissions

Emission Factor: 0.0066 lb/MMBtu (AP-42, Table 3.1-2a, 04/00)
Calculations: 0.0066 lb/MMBtu * 11.7 MMBtu/hr * 8760 hr/yr * 0.0005 ton/lb = 0.34 ton/yr

PM_{10} Emissions

Emission Factor: 0.0066 lb/MMBtu (AP-42, Table 3.1-2a, 04/00)
Calculations: 0.0066 lb/MMBtu * 11.7 MMBtu/hr * 8760 hr/yr * 0.0005 ton/lb = 0.34 ton/yr

NOx Emissions

Emission Factor: 2.0 g/bhp (Department BACT Determination – Turbines with Capacity > 360 Hp)
Calculations: 2.0 g/bhp * 1149 Hp * 1 lb/453.6 g * 8760 hr/yr * 0.0005 ton/lb = 22.19 ton/yr

VOC Emissions

Emission Factor: 1.0 g/bhp (Department BACT Determination – Turbines with Capacity > 360 Hp)
Calculations: 1.0 g/bhp * 1149 Hp * 1 lb/453.6 g * 8760 hr/yr * 0.0005 ton/lb = 11.09 ton/yr

CO Emissions

Emission Factor: 3.0 g/bhp (Department BACT Determination – Turbines with Capacity > 360 Hp)
Calculations: 3.0 g/bhp * 1149 Hp * 1 lb/453.6 g * 8760 hr/yr * 0.0005 ton/lb = 33.28 ton/yr

SOx Emissions

Sulfur Content: 0.80% = S (40 CFR 60.333 Limit)
Emission Factor: 0.94S (AP-42, Table 3.1-2a, 04/00)
0.94 * 0.008 = 0.0075 lb/MMBtu
Calculations: 0.0075 lb/MMBtu * 11.7 MMBtu/hr * 8760 hr/yr * 0.0005 ton/lb = 0.39 ton/yr

3800 Solar, #16

Brake Horsepower: 3500 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 7610 Btu/hp-hr (Application 1988)
7610 Btu/hp-hr * 0.001 ft^3/btu * 3500 hp * 8760 hr/yr = 2E+08 ft^3/yr
Calculations: 233322600 ft^3/yr * 10 lbs/10^6 ft^3 gas * 0.0005 ton/lb = 1.17 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 7610 Btu/hp-hr (Application 1988)
7610 Btu/hp-hr * 0.001 ft^3/btu * 3500 hp * 8760 hr/yr = 2E+08 ft^3/yr
Calculations: 233322600 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 1.17 ton/yr

NOx Emissions:

Emission factor: 2.0 gram/bhp-hr (Information from company)
Calculations: 2.0 gram/bhp-hr * 3500 bhp * 0.00220 lb/gram * 8760 hr/yr /2000 = 67.45 ton/yr

VOC Emissions:

Emission factor: 0.75 gram/bhp-hr (Information from company)
Calculations: 0.75 gram/bhp-hr* 3500 bhp* 0.0022 lb/gram * 8760 hr/yr /2000= 25.29 ton/yr

CO Emissions:

Emission factor: 1.00 gram/bhp-hr (Information from company)
Calculations: 1.00 gram/bhp-hr * 3500 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 33.73 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 3500 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.07 ton/yr

559 Waukesha, #17

Brake Horsepower: 559 bhp
Hours of operation: 8760 hr/yr

PM Emissions

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 7875 Btu/hp-hr (Information from company)
7875 Btu/hp-hr * 0.001 ft^3/btu * 559 hp * 8760 hr/yr = 4E+07 ft^3/yr
Calculations: 38562615 ft^3/yr * 10 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.19 ton/yr

PM_{10} Emissions:

Emission Factor: 10 lb/10^6 ft^3 gas (2-02-002-02, AFSSCC page 32)
Fuel Consumption: 7875 Btu/hp-hr (Information from company)
7875 Btu/hp-hr * 0.001 ft^3/btu * 559 hp * 8760 hr/yr = 4E+07 ft^3/yr
Calculations: 38562615 ft^3/yr * 10 lbs/10^6 ft^3 gas * 0.0005 ton/lb = 0.19 ton/yr

NOx Emissions:

Emission factor: 2.0 gram/bhp-hr (Manufacturers Design)
Calculations: 2.0 gram/bhp-hr * 559 bhp* 0.0022 lb/gram* 8760 hr/yr /2000 = 10.77 ton/yr

VOC Emissions:

Emission factor: 1.00 gram/bhp-hr (Manufacturers Design)
Calculations: 1.00 gram/bhp-hr* 559 bhp* 0.0022 lb/gram* 8760 hr/yr /2000= 5.39 ton/yr

CO Emissions:

Emission factor: 3.30 gram/bhp-hr (Manufacturers Design)
Calculations: 3.30 gram/bhp-hr * 559 bhp* 0.0022 lb/gram* 8760 hr/yr /2000 = 17.78 ton/yr

SOx Emissions:

Emission factor: 0.002 gram/hp-hr (AP-42, Table 3.2-1, 9/85)
Calculations: 0.002 gram/hp-hr * 559 bhp * 0.0022 lb/gram * 8760 hr/yr /2000 = 0.01 ton/yr

Dehy Heater, #18 15.25 MMBtu/hr

PM Emissions

Emission Factor: 13.7 lb/10^6 ft^3 gas (AP-42, 1.4-1, 10/92)
Fuel Consumption: 128.58 10^6 ft^3/yr (Application 1988)
Calculations: 128.58 * 10^6 ft^3/yr * 13.7 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.88 ton/yr

PM_{10} Emissions:

Emission Factor: 13.7 lb/10^6 ft^3 gas (AP-42, 1.4-1, 10/92)
Fuel Consumption: 128.58 10^6 ft^3/yr (Application 1988)
Calculations: 128.58 * 10^6 ft^3/yr * 13.7 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.88 ton/yr

NOx Emissions:

Emission Factor: 140 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 128.58 10^6 ft^3/yr (Application 1988)
Calculations: 128.58 * 10^6 ft^3/yr * 140 lb/10^6 ft^3 gas * 0.0005 ton/lb = 9.00 ton/yr

VOC Emissions:

Emission Factor: 5.8 lb/10^6 ft^3 gas (AP-42, 1.4-3, 10/92)
Fuel Consumption: 128.58 10^6 ft^3/yr (Application 1988)
Calculations: 128.58 * 10^6 ft^3/yr * 5.8 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.37 ton/yr

CO Emissions:

Emission Factor: 35 lb/10^6 ft^3 (AP-42, 1.4-2, 10/92)
Fuel Consumption: 128.58 10^6 ft^3/yr (Application 1988)
Calculations: 128.58 * 10^6 ft^3/yr * 35 lb/10^6 ft^3 gas * 0.0005 ton/lb = 2.25 ton/yr

SOx Emissions:

Emission Factor: 0.6 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 128.58 10^6 ft^3/yr (Application 1988)
Calculations: 128.58 * 10^6 ft^3/yr * 0.6 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.04 ton/yr

Mueller Boiler, #19 819,000 Btu/hr

PM Emissions

Emission Factor: 12.0 lb/10^6 ft^3 gas (AP-42, 1.4-1, 10/92)
Fuel Consumption: 6.91 10^6 ft^3/yr (Application 1988)
Calculations: 6.91 * 10^6 ft^3/yr * 12.0 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.04 ton/yr

PM_{10} Emissions:

Emission Factor: 12.0 lb/10^6 ft^3 gas (AP-42, 1.4-1, 10/92)
Fuel Consumption: 6.91 10^6 ft^3/yr (Application 1988)
Calculations: 6.91 * 10^6 ft^3/yr * 12.0 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.04 ton/yr

NOx Emissions:

Emission Factor: 100 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 6.91 10^6 ft^3/yr (Application 1988)
Calculations: 6.91 * 10^6 ft^3/yr * 100 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.35 ton/yr

VOC Emissions:

Emission Factor: 5.8 lb/10^6 ft^3 gas (AP-42, 1.4-3, 10/92)
Fuel Consumption: 6.91 10^6 ft^3/yr (Application 1988)
Calculations: 6.91 * 10^6 ft^3/yr * 5.8 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.02 ton/yr

CO Emissions:

Emission Factor: 21 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 6.91 10^6 ft^3/yr (Application 1988)
Calculations: 6.91 * 10^6 ft^3/yr * 21 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.07 ton/yr

SOx Emissions:

Emission Factor: 0.6 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 6.91 10^6 ft^3/yr (Application 1988)
Calculations: 6.91 * 10^6 ft^3/yr * 0.6 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.00 ton/yr

Mueller Boiler, #20 770,000 Btu/hr

PM Emissions

Emission Factor: 12.0 lb/10^6 ft^3 gas (AP-42, 1.4-1, 10/92)
Fuel Consumption: 6.49 10^6 ft^3/yr (Application 1988)
Calculations: 6.49 * 10^6 ft^3/yr * 12.0 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.04 ton/yr

PM_{10} Emissions:

Emission Factor: 12.0 lb/10^6 ft^3 gas (AP-42, 1.4-1, 10/92)
Fuel Consumption: 6.49 10^6 ft^3/yr (Application 1988)
Calculations: 6.49 * 10^6 ft^3/yr * 12.0 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.04 ton/yr

NOx Emissions:

Emission Factor: 100 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 6.49 10^6 ft^3/yr (Application 1988)
Calculations: 6.49 * 10^6 ft^3/yr * 100 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.32 ton/yr

VOC Emissions:

Emission Factor: 5.8 lb/10^6 ft^3 gas (AP-42, 1.4-3, 10/92)
Fuel Consumption: 6.49 10^6 ft^3/yr (Application 1988)
Calculations: 6.49 * 10^6 ft^3/yr * 5.8 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.02 ton/yr

CO Emissions:

Emission Factor: 21 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 6.49 10^6 ft^3/yr (Application 1988)
Calculations: 6.49 * 10^6 ft^3/yr * 21 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.07 ton/yr

SOx Emissions:

Emission Factor: 0.6 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 6.49 10^6 ft^3/yr (Application 1988)
Calculations: 6.49 * 10^6 ft^3/yr * 0.6 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.00 ton/yr

Eclipse Heater, #21 450,000 Btu/hr

PM Emissions

Emission Factor: 12.0 lb/10^6 ft^3 gas (AP-42, 1.4-1, 10/92)
Fuel Consumption: 3.79 10^6 ft^3/yr (Application 1988)
Calculations: 3.79 * 10^6 ft^3/yr * 12.0 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.02 ton/yr

PM_{10} Emissions:

Emission Factor: 12.0 lbs/10^6 ft^3 gas (AP-42, 1.4-1, 10/92)
Fuel Consumption: 3.79 10^6 ft^3/yr (Application 1988)
Calculations: 3.79 * 10^6 ft^3/yr * 12.0 lbs/10^6 ft^3 gas * 0.0005 tons/lb = 0.02 tons/yr

NOx Emissions:

Emission Factor: 100 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 3.79 10^6 ft^3/yr (Application 1988)
Calculations: 3.79 * 10^6 ft^3/yr * 100 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.19 ton/yr

VOC Emissions:

Emission Factor: 5.8 lb/10^6 ft^3 gas (AP-42, 1.4-3, 10/92)
Fuel Consumption: 3.79 10^6 ft^3/yr (Application 1988)
Calculations: 3.79 * 10^6 ft^3/yr * 5.8 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.01 ton/yr

CO Emissions:

Emission Factor: 21 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 3.79 10^6 ft^3/yr (Application 1988)
Calculations: 3.79 * 10^6 ft^3/yr * 21 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.04 ton/yr

SOx Emissions:

Emission Factor: 0.6 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 3.79 10^6 ft^3/yr (Application 1988)
Calculations: 3.79 * 10^6 ft^3/yr * 0.6 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.00 ton/yr

Bryant Heater, #22 1.47 MMBtu/hr

PM Emissions

Emission Factor: 13.7 lb/10^6 ft^3 gas (AP-42, 1.4-1, 10/92)
Fuel Consumption: 12.39 10^6 ft^3/yr (Application 1988)
Calculations: 12.39 * 10^6 ft^3/yr * 13.7 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.08 ton/yr

PM_{10} Emissions:

Emission Factor: 13.7 lb/10^6 ft^3 gas (AP-42, 1.4-1, 10/92)
Fuel Consumption: 12.39 10^6 ft^3/yr (Application 1988)
Calculations: 12.39 * 10^6 ft^3/yr * 13.7 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.08 ton/yr

NOx Emissions:

Emission Factor: 140 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 12.39 10^6 ft^3/yr (Application 1988)
Calculations: 12.39 * 10^6 ft^3/yr * 140 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.87 ton/yr

VOC Emissions:

Emission Factor: 5.8 lb/10^6 ft^3 gas (AP-42, 1.4-3, 10/92)
Fuel Consumption: 12.39 10^6 ft^3/yr (Application 1988)
Calculations: 12.39 * 10^6 ft^3/yr * 5.8 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.04 ton/yr

CO Emissions:

Emission Factor: 35 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 12.39 10^6 ft^3/yr (Application 1988)
Calculations: 12.39 * 10^6 ft^3/yr * 35 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.22 ton/yr

SOx Emissions:

Emission Factor: 0.6 lb/10^6 ft^3 gas (AP-42, 1.4-2, 10/92)
Fuel Consumption: 12.39 10^6 ft^3 /yr (Application 1988)
Calculations: 12.39 * 10^6 ft^3/yr * 0.6 lb/10^6 ft^3 gas * 0.0005 ton/lb = 0.00 ton/yr

V. Existing Air Quality

The existing air quality in the proposed area of operation is unclassified or attainment for the national standards. Based on air dispersion modeling submitted by WBI – Cabin Creek, the Department determined that the proposed project, with conditions, will not cause or contribute to a violation of any ambient air quality standard. A summary of modeled impacts is contained in Section VI of the permit analysis.

VI. Ambient Air Impact Analysis

The Department determined, based on ambient air modeling, that the impact from this permitting action will be minor. The Department believes the proposed project, with conditions, will not cause or contribute to a violation of any ambient air quality standard.

The maximum estimated emission increases from the operation of the 1,149 hp Solar Saturn Mark II gas turbine are approximately 22.2 tons per year (tpy) of NO_x, 33.3 tpy of CO, 0.3 tpy of particulate matter with a mean aerodynamic diameter of less than 10 micrometers (PM_{10}), 11.1 tpy of VOCs and 0.04 tpy of sulfur dioxide (SO_2).

A. CO Impact Analysis

The initial WBI – Cabin Creek application included NO_x and CO air dispersion modeling for the proposed project to demonstrate compliance with the Montana and National Ambient Air Quality Standards (MAAQS and NAAQS). The ISC3 model was used along with 6 years of meteorological data (1986-1991). The surface data was collected at the Williston/Sloulin International Airport and the Bismarck Airport upper air data were utilized for the project.

The initial modeling demonstration showed that CO emission impacts from the proposed project are well below the applicable standard, as shown in Table 1. Because the required equipment/operating modifications (discussed under the following NO_x modeling analysis) will further reduce potential CO air impacts, the Department determined that no additional CO modeling was required for the proposed project.

Table 1

Pollutant	Averaging Period	Max. Cumulative Impact ($\mu g/m^3$)	Applicable Standard ($\mu g/m^3$)
CO	1-Hour	1662.3	40,000
CO	8-Hour	857.7	10,000

B. NO_x Impact Analysis

Based on various problems with the initial NO_x modeling demonstration, the Department issued an incompleteness letter for the initial NO_x modeling demonstration. Subsequently, the Department received the requested additional information. The additional information submitted showed that WBI – Cabin Creek was below the applicable NO_x standards; however, NO_x impacts were shown to be greater than 95% of the ambient standard. Therefore, in accordance with the Department's October 9, 1998, Guidance Statement "Monitoring Requirements," WBI – Cabin Creek would be required to conduct ambient monitoring for NO_2.

However, WBI – Cabin Creek submitted a letter requesting, among other things (see discussion below), that the number of hours of operation of the 190 hp Ingersol Rand 6XVG engine (Unit 4) be limited in order to avoid ambient monitoring requirements. The NO_x modeling demonstration includes an analysis of the WBI – Cabin Creek proposed limitation on hours of operation for Unit 4 in addition to a demonstration of compliance with applicable NO_x standards.

Table 2 shows the stack heights that were submitted subsequent to the initial modeling demonstration and that were used for this modeling demonstration. All other stack parameters (e.g., stack velocity, diameter, and temperature) remained the same in each submittal.

Table 2. Stack Heights and Locations at the WBI Cabin Creek Facility

Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)
Unit1	544553.3	5162170	821.7	14.63
Unit4	544551.2	5162160	821.7	14.63
Unit5	544551.2	5162155	821.7	14.94
Unit6	544551.2	5162150	821.7	14.94
Unit7	544551.2	5162145	821.7	14.94
Unit8	544553.3	5162178	821.7	14.94
Unit9	544553.3	5162188	821.7	14.94
Unit10	544553.3	5162196	821.7	14.94
Unit11	544509	5162222	821.7	6.41
Unit12	544509	5162226	821.7	6.41
Unit13	544509	5162230	821.7	6.41
Unit14	544509	5162235	821.7	6.41
Unit16	544546.4	5162214	821.7	9.14
Gen1	544460.7	5162227	821.7	6.71
Misc1	544464.9	5162191	821.7	7.62
Misc2	544580	5162149	821.7	5.49
Misc3	544577	5162150	821.7	5.49
Misc4	544577	5162150	821.7	5.49
Misc5	544459.1	5162197	821.7	6.1
Unit15	544509	5162239	821.7	6.41

Table 3 shows the emission rate changes from the initial modeling submittal. The only changes made to the model runs were adjusting the emission rates for the annual standard for Unit 4 to account for the reduced hours of operation.

Table 3. Emission Rates of the Sources Located at the WBI Cabin Creek Facility

Source ID	Easting (X) (m)	Northing (Y) m)	Base Elevation (m)	Permitted Demonstration Emission Rate (lb/hr)	Initial Demonstration Emission Rate (lb/hr)	Emission Rate Change (lb/hr)
Unit1	544553.3	5162170	821.7	4.89	4.85	0.04
Unit4	544551.2	5162160	821.7	10.47	10.47	0.00
Unit5	544551.2	5162155	821.7	16.54	16.53	0.00
Unit6	544551.2	5162150	821.7	16.54	16.53	0.00
Unit7	544551.2	5162145	821.7	16.54	16.53	0.00
Unit8	544553.3	5162178	821.7	17.46	36.38	-18.92
Unit9	544553.3	5162188	821.7	23.28	48.50	-25.22
Unit10	544553.3	5162196	821.7	23.28	48.50	-25.22
Unit11	544509	5162222	821.7	3.95	3.88	0.07
Unit12	544509	5162226	821.7	3.95	3.88	0.07
Unit13	544509	5162230	821.7	3.95	3.88	0.07
Unit14	544509	5162235	821.7	3.95	3.97	-0.02
Unit16	544546.4	5162214	821.7	16.72	16.75	-0.03
Gen1	544460.7	5162227	821.7	2.46	2.47	-0.01
Misc1	544464.9	5162191	821.7	2.14	2.14	0.00
Misc2	544580	5162149	821.7	0.21	0.21	0.00
Misc3	544577	5162150	821.7	0.11	0.12	0.00
Misc4	544577	5162150	821.7	0.11	0.11	0.00
Misc5	544459.1	5162197	821.7	0.06	0.06	0.00

Unit15	544509	5162239	821.7	5.07	6.97	-1.90
Totals				171.68	242.73	-71.05

The results of the modeling, when limiting the hours of operation for Unit 4, are outlined in Table 4. All other units operate at 8,760 hours per year at the emission rates specified in Table 3. The modeled concentrations for the 1-hour ambient standard remain the same while the annual modeled concentration varies according to the number of hours that Unit 4 is allowed to operate within the rolling 12-month time period.

Table 4. Ambient Modeling Results for NO_2 When Limiting Hours of Operation for Unit #4

Unit 4 (hrs/yr)	Avg. Period	Emissions Modeled (lb/hr)	NOx Modeled Conc. ($\mu g/m^3$)	OLM/ARM[b] Adjusted to NO_2 ($\mu g/m^3$)	Back-ground Conc. ($\mu g/m^3$)	Ambient Conc. ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	MAAQS ($\mu g/m^3$)	% Of MAAQS
8760	1-hr[a]	10.47	1767.7	364.6	75	439.6	------	564	77.9
4000	Annual	4.78	111.5	83.6[b]	6	89.6	100	94	95.3
3500	Annual	3.59	110.9	86.2	6	89.2	100	94	94.9
3000	Annual	2.99	110.5	82.8	6	88.8	100	94	94.5
2000	Annual	2.39	109.5	82.1	6	88.1	100	94	93.7
1000	Annual	1.20	108.5	81.3	6	87.3	100	94	92.9
500	Annual	0.60	108.0	81.0	6	87.0	100	94	92.5

[a] High-second high concentration

[b]Applying the Ozone Limiting Method for the 1-hour standard and the Ambient Ratio Method with National Default of 75% for the annual standard.

As shown in the above-discussed CO and NO_x modeling demonstration, impacts from the proposed WBI – Cabin Creek project should not contribute to a violation of the MAAQS/NAAQS and will not require ambient monitoring. In addition to limiting Unit 4 operating hours to 3500 hours per year, the following permitted equipment/operational changes were determined to be necessary to demonstrate compliance with the NO_x NAAQS/MAAQS and avoid ambient NO_x monitoring. Under the current permit action, WBI – Cabin Creek must install an NSCR system on Unit 1; raise the stack heights on Unit 1 and Units 4 through 10; and lower allowable NO_x emissions for Units 8 through 10. Permit #2484-03 includes conditional requirements for all previously cited equipment/operational modifications. The Department believes that the WBI – Cabin Creek facility will maintain compliance with all applicable standards, as permitted.

The modeling submitted in support of Permit Application #2484-03 shows compliance with the applicable ambient standards; therefore, the Department determined that operation of the proposed turbine will not cause or contribute to a violation of any ambient air quality standard.

VII. Taking or Damaging Implication Analysis

As required by 2-10-105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air and Waste management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: WBI - Cabin Creek Compressor Station
Williston Basin Interstate Pipeline Company
1651 Cabin Creek Road #1
Baker, MT 59313

Air Quality Permit number: 2484-03

Preliminary Determination Issued: April 28, 2003
Department Decision Issued: May 16, 2003
Permit Final: June 3, 2003

1. *Legal Description of Site*: The Williston Basin Interstate Pipeline Company – Cabin Creek Compressor Station (WBI – Cabin Creek) is located in the SE¼ of the SE¼ of Section 16, Township 10 North, Range 58 East, Fallon County, Montana. The mailing address of the facility is HC 72, Box 6019, Baker, MT 59313.

2. *Description of Project*: Under the current permit action WBI – Cabin Creek would add an 1149 Hp natural gas fired turbine to the permitted facility.

3. *Objectives of Project*: The purpose of the proposed turbine addition to the permitted facility is to increase business and revenue for the company.

4. *Alternatives Considered*: In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the air quality preconstruction permit to the proposed facility. However, the Department does not consider the "no-action" alternative to be appropriate because WBI – Cabin Creek demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a BACT analysis, would be included in Permit #2484-03.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Terrestrial and Aquatic Life and Habitats			X			
B	Water Quality, Quantity, and Distribution			X			
C	Geology and Soil Quality, Stability, and Moisture			X			
D	Vegetation Cover, Quantity, and Quality			X			
E	Aesthetics				X		
F	Air Quality			X			
G	Unique Endangered, Fragile, or Limited Environmental Resource			X			
H	Demands on Environmental Resource of Water, Air, and Energy			X			
I	Historical and Archaeological Sites				X		
J	Cumulative and Secondary Impacts			X			

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic life and Habitats:

Emissions from the proposed project would affect terrestrial and aquatic life and habits in the proposed project area. However, as detailed in Section VI of the permit analysis, any emissions and resulting impacts from the project would maintain compliance with the Montana and National Ambient Air Quality Standards (MAAQS/NAAQS). The MAAQS/NAAQS are designed to be protective of the environment including terrestrial and aquatic life and habits of the proposed project area.

Further, WBI - Cabin Creek would operate within an existing industrial location and no additional construction or ground disturbance to the area would be required. Overall, any impact to the terrestrial and aquatic life and habits of the proposed project area would be minor.

B. Water Quality, Quantity and Distribution:

The proposed project would not affect water quantity or distribution in the proposed project area because the proposed Unit 15 would operate within an existing building and would not discharge or use water as part of the project.

Further, as detailed in Section VI of the permit analysis, any emissions and resulting impacts from the project would maintain compliance with the MAAQS/NAAQS. The MAAQS/NAAQS are designed to be protective of the environment including water quality of the proposed project area. Overall, any impacts to water quality, quantity, and distribution in the proposed project area would be minor.

C. Geology and Soil Quality, Stability, and Moisture:

The proposed project would have a minor impact on the geology, soil quality, stability, and moisture of the proposed project area because the proposed Unit 15 would operate within an existing industrial location and, as described in Section V and Section VI of the permit analysis,

would result in minor air pollution emissions to the outside ambient environment. These pollutants would deposit on the soils in the surrounding area. Any impact from deposition of these pollutants would be minor due to good dispersion characteristics of the proposed project area and the low concentration of pollutants emitted. Overall, any impacts to local geology, soil quality, stability, and moisture would be minor.

D. Vegetation Cover, Quantity, and Quality:

Emissions from the proposed project would impact vegetation cover, quantity, and quality in the proposed project area. However, as detailed in Section V and VI of the permit analysis any emissions and resulting impacts from the project would be minor.

Further, the proposed Unit 15 would operate within an existing building located in an area zoned as industrial so no additional construction or operating disturbance to the area would be required. Overall, any impact to the vegetation cover, quantity, and quality of the proposed project area would be minor.

E. Aesthetics:

The proposed project would not result in any impact on the aesthetic nature of the proposed project area because the proposed Unit 15 would operate within an existing building located in an area zoned as industrial and no additional construction or site disturbance would be required for the project. Further, visible emissions from the source would be limited to 20% opacity and would be generated within the existing building thus decreasing visible impacts.

F. Air Quality:

The proposed project would result in the emission of various criteria air pollutants to the ambient air in the proposed project area. However, as detailed in Section V and Section VI of the permit analysis, WBI – Cabin Creek demonstrated, through air dispersion modeling, that any air quality impacts from the proposed project would be minor. A summary of ambient impacts is included below.

The maximum estimated emission increases from the operation of the 1,149 hp Solar Saturn Mark II gas turbine would be approximately 22.2 tons per year (tpy) of NO_x, 33.3 tpy of CO, 0.3 tpy of particulate matter with a mean aerodynamic diameter of less than 10 micrometers (PM_{10}), 11.1 tpy of volatile organic compounds (VOC) and 0.04 tpy of sulfur dioxide (SO_2).

CO Impact Analysis

The initial WBI – Cabin Creek application included NO_x and CO air dispersion modeling for the proposed project to demonstrate compliance with the MAAQS and NAAQS. The ISC3 model was used along with 6 years of meteorological data (1986-1991). The surface data was collected at the Williston/Sloulin International Airport and the Bismarck Airport upper air data were utilized for the project.

The initial modeling demonstration showed that CO emission impacts from the proposed project would be well below the applicable standard, as shown in Table 1. Because the required equipment/operating modifications (discussed under the following NO_x modeling analysis) would further reduce potential CO air impacts, the Department determined that no additional CO modeling would be required for the proposed project.

Table 1

Pollutant	Averaging Period	Max. Cumulative Impact ($\mu g/m^3$)	Applicable Standard ($\mu g/m^3$)
CO	1-Hour	1662.3	40,000
CO	8-Hour	857.7	10,000

NO_x Impact Analysis

Based on various problems with the initial NO_x modeling demonstration, the Department issued an incompleteness letter for the initial NO_x modeling demonstration. Subsequently, the Department received the requested additional information. The additional information submitted showed that WBI – Cabin Creek was below the applicable NO_x standards; however, NO_x impacts were shown to be greater than 95% of the ambient standard. Therefore, in accordance with the Department's October 9, 1998 Guidance Statement "Monitoring Requirements," WBI – Cabin Creek would be required to conduct ambient monitoring for NO_2.

However, WBI – Cabin Creek submitted a letter requesting, among other things (see discussion below), that the number of hours of operation of the 190 hp Ingersol Rand 6XVG engine (Unit 4) be limited in order to avoid ambient monitoring requirements. The NO_x modeling demonstration includes an analysis of the WBI – Cabin Creek proposed limitation on hours of operation for Unit 4 in addition to a demonstration of compliance with applicable NO_x standards.

Table 2 shows the stack heights that were submitted subsequent to the initial modeling demonstration and that were used for this modeling demonstration. All other stack parameters (e.g., stack velocity, diameter, and temperature) remained the same in each submittal.

Table 2. Stack Heights and Locations at the WBI Cabin Creek Facility

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Unit6	544551.2	5162150	821.7	14.94
Unit7	544551.2	5162145	821.7	14.94
Unit8	544553.3	5162178	821.7	14.94
Unit9	544553.3	5162188	821.7	14.94
Unit10	544553.3	5162196	821.7	14.94
Unit11	544509	5162222	821.7	6.41
Unit12	544509	5162226	821.7	6.41
Unit13	544509	5162230	821.7	6.41
Unit14	544509	5162235	821.7	6.41
Unit16	544546.4	5162214	821.7	9.14
Gen1	544460.7	5162227	821.7	6.71
Misc1	544464.9	5162191	821.7	7.62
Misc2	544580	5162149	821.7	5.49
Misc3	544577	5162150	821.7	5.49
Misc4	544577	5162150	821.7	5.49
Misc5	544459.1	5162197	821.7	6.1
Unit15	544509	5162239	821.7	6.41

Table 3 shows the emission rate changes from the initial modeling submittal. The only changes made to the model runs were adjusting the emission rates for the annual standard for Unit 4 to account for the reduced hours of operation.

Table 3. Emission Rates of the Sources Located at the WBI Cabin Creek Facility

Source ID	Easting (X) (m)	Northing (Y) m)	Base Elevation (m)	Initial Demonstration Emission Rate (lb/hr)	Permitted Emission Rate (lb/hr)	Emission Rate Change (lb/hr)
Unit1	544553.3	5162170	821.7	4.89	4.85	0.04
Unit4	544551.2	5162160	821.7	10.47	10.47	0.00
Unit5	544551.2	5162155	821.7	16.54	16.53	0.00
Unit6	544551.2	5162150	821.7	16.54	16.53	0.00
Unit7	544551.2	5162145	821.7	16.54	16.53	0.00
Unit8	544553.3	5162178	821.7	17.46	36.38	-18.92
Unit9	544553.3	5162188	821.7	23.28	48.50	-25.22
Unit10	544553.3	5162196	821.7	23.28	48.50	-25.22
Unit11	544509	5162222	821.7	3.95	3.88	0.07
Unit12	544509	5162226	821.7	3.95	3.88	0.07
Unit13	544509	5162230	821.7	3.95	3.88	0.07
Unit14	544509	5162235	821.7	3.95	3.97	-0.02
Unit16	544546.4	5162214	821.7	16.72	16.75	-0.03
Gen1	544460.7	5162227	821.7	2.46	2.47	-0.01
Misc1	544464.9	5162191	821.7	2.14	2.14	0.00
Misc2	544580	5162149	821.7	0.21	0.21	0.00
Misc3	544577	5162150	821.7	0.11	0.12	0.00
Misc4	544577	5162150	821.7	0.11	0.11	0.00
Misc5	544459.1	5162197	821.7	0.06	0.06	0.00
Unit15	544509	5162239	821.7	5.07	6.97	-1.90
Totals				171.68	242.73	-71.05

The results of the modeling, when limiting the hours of operation for Unit 4, are outlined in Table 4. All other units operate at 8,760 hours per year at the emission rates specified in Table 3. The modeled concentrations for the 1-hour ambient standard remain the same while the annual modeled concentration varies according to the number of hours that Unit 4 is allowed to operate within the rolling 12-month time period.

Table 4. Ambient Modeling Results for NO_2 When Limiting Hours of Operation for Unit #4

Unit 4 (hrs/yr)	Avg. Period	Emissions Modeled (lb/hr)	NOx Modeled Conc. ($\mu g/m^3$)	OLM/ARM[b] Adjusted to NO_2 ($\mu g/m^3$)	Back-ground Conc. ($\mu g/m^3$)	Ambient Conc. ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	MAAQS ($\mu g/m^3$)	% Of MAAQS
8760	1-hr[a]	10.47	1767.7	364.6	75	439.6	------	564	77.9
4000	Annual	4.78	111.5	83.6 [b]	6	89.6	100	94	95.3
3500	Annual	3.59	110.9	86.2	6	89.2	100	94	94.9
3000	Annual	2.99	110.5	82.8	6	88.8	100	94	94.5
2000	Annual	2.39	109.5	82.1	6	88.1	100	94	93.7
1000	Annual	1.20	108.5	81.3	6	87.3	100	94	92.9
500	Annual	0.60	108.0	81.0	6	87.0	100	94	92.5

[a] High-second high concentration

[b] Applying the Ozone Limiting Method for the 1-hour standard and the Ambient Ratio Method with National Default of 75% for the annual standard.

As shown in the above-discussed CO and NO_x modeling demonstration, impacts from the proposed WBI – Cabin Creek project should not contribute to a violation of the MAAQS/NAAQS and will not require ambient monitoring. In addition to limiting Unit 4

operating hours to 3500 hours per year, the following permitted equipment/operational changes were determined to be necessary to demonstrate compliance with the NO_x NAAQS/MAAQS and avoid ambient NO_x monitoring. Under the current permit action, WBI – Cabin Creek must install an NSCR system on Unit 1; raise the stack heights on Unit 1 and Units 4 through 10; and lower allowable NO_x emissions for Units 8 through 10. Permit #2484-03 includes conditional requirements for all previously cited equipment/operational modifications. The Department believes that the WBI – Cabin Creek facility will maintain compliance with all applicable standards, as permitted.

The modeling submitted in support of Permit Application #2484-03 shows compliance with the ambient standards; therefore, the Department determined that operation of the proposed turbine would not cause or contribute to a violation of any ambient air quality standard. Overall, any impacts to ambient air quality from the proposed turbine would be minor.

G. Unique Endangered, Fragile, or Limited Environmental Resources:

Emissions from the proposed project would affect unique, endangered, fragile, or limited environmental resources located in the proposed project area. However, as detailed in Section V and VI of the permit analysis, any emissions and resulting impacts from the project would be minor due the good pollutant dispersion characteristics of the proposed area and the low concentration of those pollutants emitted.

Further, the Unit 15 would operate within an existing building located in an area zoned as industrial so no additional construction or operating disturbance to the area would be required. Overall, any impact to the unique, endangered, fragile, or limited environmental resources in the proposed project area would be minor.

H. Demands on Environmental Resource of Water, Air, and Energy:

The proposed project would result in minor demands on environmental resources of water and air as discussed in Section 7.B and 7.F of this EA, respectively. Further, as detailed in Section V and VI of the permit analysis, project impacts on air resources in the proposed project area would be minor due to limits that would be included in Permit #2484-03, good dispersion characteristics of the proposed project area, and the low concentration of those pollutants emitted. Finally, because the project is small by industrial standards, little energy would be required for operation and the resulting impact on energy resources would be minor.

I. Historical and Archaeological Sites:

The proposed project would not result in any impact to historical and archaeological sites in the proposed project area. WBI - Cabin Creek would operate the proposed Unit 15 within an existing building located in an area zoned as industrial and would not require any additional construction or ground disturbance.

According to previous correspondence from the Montana State Historic Preservation Office, there is low likelihood of any disturbance to any known archaeological or historic site, given previous industrial disturbance within the area. Therefore, the operation would have no impact on any known historic or archaeological site that may be located within or near the proposed operating site.

J. Cumulative and Secondary Impacts:

Overall, the cumulative and secondary impacts from this project on the physical and biological environment in the immediate area would be minor due to the relatively small size of the operation. As described in Section V and VI of the permit analysis, WBI – Cabin Creek demonstrated through air dispersion modeling that the permitted facility would maintain compliance with all applicable ambient air quality standards. These standards are designed to be protective of the physical and biological environment; therefore, the Department does not expect that operations would lead to anything but potential minor cumulative impacts to these resources. The Department believes that this facility could be expected to operate in compliance with all applicable rules, regulations, and standards as outlined in Permit #2484-03.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comments Included
A	Social Structures and Mores				X		
B	Cultural Uniqueness and Diversity				X		
C	Local and State Tax Base and Tax Revenue				X		
D	Agricultural or Industrial Production				X		
E	Human Health			X			
F	Access to and Quality of Recreational and Wilderness Activities				X		
G	Quantity and Distribution of Employment				X		
H	Distribution of Population				X		
I	Demands for Government Services			X			
J	Industrial and Commercial Activity			X			
K	Locally Adopted Environmental Plans and Goals				X		
L	Cumulative and Secondary Impacts			X			

SUMMARY OF COMMENTS ON POTENTIAL ECENOMIC AND SOCIAL EFFECTS: The Department has prepared the following comments.

A. Social Structures and Mores:

The proposed project would not have any affect on the social structures or mores of the proposed area of operation. Operations would take place within an existing building located in an area zoned as industrial. The predominant use of the surrounding area would not change as a result of the proposed project; thus, there would be no impact to the social structure of the area.

B. Cultural Uniqueness and Diversity:

The proposed project would not have any affect on cultural uniqueness and diversity of the proposed area of operation. Operations would take place within an existing building located in an area zoned as industrial. The predominant use of the surrounding area would not change as a

result of the proposed project; thus there would be no impact to the cultural uniqueness and diversity of the area.

C. Local and State Tax Base and Tax Revenue:

The proposed project would not affect the local and state tax base and tax revenue. The project is small by industrial standards and operations would take place in an existing building located in an area zoned as industrial. Further, the project would not require any new jobs or additional new construction.

D. Agricultural or Industrial Production:

Because the proposed project would operate within an existing building located in an area zoned as industrial, the project would not affect or displace any land used for agricultural production and would not require any additional industrial construction. Further, no additional industrial production would result from the proposed project.

E. Human Health:

The proposed project would result in the emission of air pollutants. However, as detailed in Section 7.F of this EA and Section VI of the permit analysis WBI – Cabin Creek would be required to use BACT and maintain compliance with all ambient air quality standards. Air dispersion modeling conducted for the proposed project demonstrated compliance with all applicable NAAQS and MAAQS. These standards are designed to be protective of human health. Any health impacts resulting from the proposed project would be minor.

F. Access to and Quality of Recreational and Wilderness Activities:

Because the proposed project would operate within an existing building located in an area zoned as industrial, the project would not affect any access to or quality of any recreation or wilderness activities in the area.

G. Quantity and Distribution of Employment:

The proposed project would not require any new employment in the area. Unit 15 would be operated by existing WBI – Cabin Creek employees and would not require any new employees for normal operations. Therefore, the proposed project would not affect any quantity and distribution of employment in the area.

H. Distribution of Population:

The proposed project would not require any new employment or require the immigration of any new people to the proposed project area. Therefore, the proposed project would not affect the distribution of population in the proposed project area.

I. Demands for Government Services:

Government services would be required for acquiring the appropriate permits from government agencies. In addition, the permitted source of emissions would be subject to periodic inspections by government personnel. Demands for government services would be minor.

J. Industrial and Commercial Activity:

The proposed project would not impact local industrial and commercial activity because the proposed project would operate within an existing building located in an area zoned as industrial, would not require any additional industrial construction, and would not result in additional industrial production or commercial activity.

K. Locally Adopted Environmental Plans and Goals:

The Department is not aware of any locally adopted environmental plans or goals in the immediate area affected by the proposed project. The state standards would be protective of the proposed project area.

L. Cumulative and Secondary Impacts:

Overall, cumulative and secondary impacts from this project would result in minor impacts to the economic and social environment in the immediate area due to the relatively small size of the operation. The proposed project would likely result in a minor increase in production from the facility but would not result in any local increase in industrial production outside of the permitted facility. In addition, the local population and employment base would not change as a result of the proposed project; therefore, no cumulative or secondary economic or other social impacts would be expected to occur as a result of the static population structure. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #2484-03.

Recommendation: No EIS is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permit action is for the construction and operation of a natural gas fired turbine (Unit 15). Permit #2484-03 includes conditions and limitations to ensure the facility would operate in compliance with all applicable rules and regulations. In addition, as detailed in the above EA there are no significant impacts associated with the proposed project.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program.

Individuals or groups contributing to this EA: Department of Environmental Quality – Air and Waste management Bureau, Montana Historical Society – State Historic Preservation Office, Natural Resource Information System – Montana Natural Heritage Program.

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